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SKETCHES FROM THE NOTE BOOK OF A TRAVELLER.

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HAVING obtained some valuable information in relation to some of the tertiary formations of the southern states, during a few short excursions in former years, I was induced by the enticing promise of novelty, of facts recorded in the great book of nature, which had hitherto escaped the research of the naturalist, to visit other and still more interesting portions of the south, where in the deep ravine, or beneath the overhanging bank of the broad river, or on the undulating bosom of the prairie, whose broad mantle of sunlight is uncheckered by aught save the passing cloud; where in each and all these lovely landscapes, which in their simple features are objects of untiring interest, I could yet find new and higher sources of enjoyment and instruction, and hold communion as it were with the beings of another and a former world.

Impressed with these ideas which some may deem merely the offspring of imagination, I embarked in a schooner bound for Wilmington, North Carolina, in the month of December, when the weather was extremely cold, and threatened to bar our progress to sea by a barrier of "thick ribbed ice," but I could hail with some satisfaction the north wind, however cold,

which might waft me almost with the speed of a bird to the milder temperature of the south; unfortunately for us, it had changed so much to the westward, that it drove us ashore on the first day of our voyage, whilst through the succeeding night we were regaled with the melancholy music of the wind in the rigging of the vessel, and the measured dash of the monotonous waves on her trembling frame. In the morning we happily floated off with the flood tide, assisted by an anchor carried out for the purpose, and experienced no other detention than grounding for a few hours upon a shoal in the bay, but as the wind was high and our situation dangerous, the pleasure I experienced when we exchanged the disagreeable reiterated jar, the dashing wave, and the loud voiced wind, for the still whisper of the ripple around the prow, and the gentle undulatory motion which gave promise of perfect security, I can only compare to that of the bird, which long in vain dashing against the bars of its prison, is at length set free on that boundless element which nature decreed should be its home. On the next morning we passed the capes of Delaware with a brisk and very favourable wind; our little vessel fairly skimmed like a frigate bird over the blue, undulating ocean, and in four days we were wafted over five degrees of latitude, when our chilled frames experienced the temperature of a northern spring, what time the south wind is nursing the tender violet, chilled by the shadow which winter casts back in his tardy retreat.

Few objects of interest present themselves to the voyager along our coast in the winter, for no living thing there varies the utter lifelessness around, and scarce a sail can be discerned in the distance to remind us that we are not alone on the great deep, whilst the ragged outline of the pine forest which seems to spring from out the waves, makes but a feeble impression, an indistinct idea of the populous scenes that lie beyond or around it. This dreariness was in some measure compensated by the splendour of the setting sun, which as it approached the horizon, grew to a gigantic size, and deepened in colour to a brilliant red, whilst the lower margin of its disk expanded and spread over the waters, and another sun seemed to arise from the abyss to meet his descending brother. Every night

of our short voyage was this gorgeous pageant presented to my admiring eyes; and then came the calm of night, the sails flapped idly, and over the subdued billows the moon spread her silver and mellow light. How undisturbed is the tranquillity which reigns around! no "distant hum of men," nor laugh of the giddy and delighted girl, nor voice of the distant watch dog, the homelike associates of scenery among which the path of the traveller usually lies, are heard borne upon the breeze, and the only sound which is at all familiar is the whisper of the parting waves around the prow. With a fair wind, and transparent atmosphere, we might daily descry from the mast head the tops of the distant trees, or the frequent light house, which may, in the eloquent language of scripture, be termed a "'a pillar of cloud by day and a pillar of fire by night," for in the morning it resembled a light cloud in the horizon, and in the evening gleamed like a setting planet, now suddenly beaming forth, trembling for a moment on the crest of the billow, and again lost in the bosom of the deep.

As we approached Cape Hatteras, I eagerly expected the promised view of that famed headland, more feared by mariners than even the "still-vexed Bermoothes," but all about it was calm and sunshine, and the surf rolled peacefully on the beach; we sailed within two miles of the lighthouse, and consequently were between the dangerous shoals and the main, in a channel of no great depth, and where the eddy of the Gulf Stream with a north wind swept us rapidly along. The light house of the cape was erected on what was then the extreme point, but within a few years the sand has accumulated, and formed a narrow peninsula, running two miles in a south-east direction. This has probably been caused by the action of the Gulf Stream throwing back the sand washed down the channels of numerous rivers, and carried towards the cape, where it meets the counter current or eddy of the Gulf Stream, and is heaped upon the extremity of the low and herbless peninsula. The same cause appears to have formed the dangerous shoals, not only of Hatteras, but of Cape Fear, and other similar headlands on the Atlantic coast.

After passing the shoals of Cape Fear, I embraced the favourable opportunity presented by the calm weather and smooth

sea to dredge for shells, where the depth of water was about eight fathoms. Two shells were all I obtained by the first attempt, and as I have not learned that either species has been ever found on the beach, it is reasonable to conclude that several of those species now believed to be exclusively fossil, still exist in deep water off various parts of the coast. Unfortunately I have lost the specimens, but one of them appeared to be identical with a fossil abundant on the James river, in Virginia. Another fossil shell which I have called *Astarte lunulata*, abundant near Suffolk, in Virginia, has been lately found recent for the first time by Professor Edmund Ravenel of Charleston, who informs us that it was obtained in Charleston harbour by the dredge. It is to be wished that researches so important to geology should be better attended to by gentlemen who reside in situations where many a summer afternoon might be spent in the pleasing employment of dredging.

As we entered the mouth of Cape Fear river, I experienced better success in fishing up shells, but not one was of the same kind as those first obtained. The depth was still eight fathoms, and a multitude of *Mytili*, *Arca*, &c. were obtained in every trial; scarcely one of them was alive, and few were full grown specimens, which shows that they have been carried there by the currents. A few living oysters, of excellent quality, on the authority of the captain, who ate them, were dredged from their beds in company with a pair of flounders, of so rare a species, that they were not recognized by the pilots.

It was, I think, the first day of the year when we entered Cape Fear river. The weather warm with occasional showers, and merrily did the birds sing among the branches of the towering pines, which like two armies of giants appeared drawn up in black array on either margin of the broad river. We arrived in the afternoon at the town of Wilmington, and my first impressions pictured it a gloomy congregation of ungraceful houses thrown upon a sand bank as barren as an Arabian desert, yet withal a busy and commercial port. The wharves were crowded with vessels, and the atmosphere completely darkened by mist, negroes, and smoke of the tar kilns, which gave the town such a repelling aspect, that you might have

fancied the demon Melancholy was waving his raven wing over his adopted home. A foggy atmosphere is here rendered doubly gloomy by the smoke evolved in the process of burning the long-leaved pine for the production of tar, a business very extensively carried on in the vicinity of Wilmington; but when the north wind sweeps down, purified by the intense frosts of Labrador, it is pleasing to see the mist, like a discomfited army, retreat before it in confusion, and roll along the surface of the river, whose mirror is here and there broken by a deep blue rippled expanse, whilst through the scattered ranks of the flying clouds the azure of heaven gleams forth at intervals more purely beautiful in contrast with the sombre hue of the vapours, whose mountain-like summits, however, occasionally brighten in a transient sunbeam, which falls among their parting masses, and lights up a portion of the shadowy stream, or bursts upon the summit of the sombre forest like the smile of infant innocence in contrast with the melancholy aspect of despair.

Another morning was ushered in with a transparent atmosphere, which threw its never-failing charm, its halo of purity, over scenes so lately clothed in heart-chilling gloom; and now I could almost fancy them beautiful, albeit nature has here been very sparing of ornament. However, an expanse of clear and glittering water is always pleasing; and when you can stand on the brink, and fancy you are gazing through avenues of trees, or on the fleecy clouds of another heaven beneath the surface, the heart fills with silent delight, and you could forgive Narcissus for falling in love with his own image in a mirror so perfectly beautiful. I strolled in the vicinity of the town, as my business was not in the habitations of man, but among the ruins and monuments of the antique world, those oracles of time which every where, with surpassing but mute eloquence, instruct in the temple of nature, the worshipper of the creator of all.

Limestone rocks border the river above Wilmington, and are referred to that era in the scale of formations, in which the chalk and concomitant strata of Europe were deposited, which has been so ably proved and illustrated by my friend Dr. Morton, in a recent work devoted to this most interesting subject. Beautifully limpid and sparkling are the springs which here

burst from the bosoms of the hard rocks, like a gush of virtuous feelings extorted from the flinty heart of one "unused to the melting mood." Above the limestone is a stratum of sand and shells of a far later era, none of whose organic reliquiæ bear the slightest resemblance to those of the rocks beneath, and if not identical with, are assimilated to living testacea of the sea.

From Wilmington I took passage in a steam boat for Smithville, at the mouth of Cape Fear river, a pleasant little village, on a sand bank, but destitute of interest. The only shells I could find were two species of Mytilus, which were grouped in masses by the byssus to the logs of the wharf. One of these is much smaller than the common species, and has not hitherto been noticed in the systems as an American shell. Professor Ravenel of Charleston first detected it on the coast of South Carolina. Tired of so unproductive a field, I entered the stage for Georgetown, and was put down at a house within audience of the Atlantic, from whence, for a distance of twelve miles, the stage road lies upon the sand of the sea-shore, where the ruts are daily obliterated by the tide and the wind-driven sand. This distance I determined to traverse on foot, and accordingly started early in the morning with bag and box to stow away such marine productions as I might pick up while passing along the shell-paved beach. The day was warm, and an easterly wind brought in a mist from the ocean, as drenching as a shower of rain. On one hand spread out the vast and solemn voiced main, now curtained from my view by impenetrable vapours, and on the other a gloomy woodland; tenanted by the wild cat and deer, and seldom broken by the hand of industry, which would be scantily repaid the cares lavished on the ungrateful and sterile soil.

Although I have seen most of those features of uncultivated nature which furnish the imagination with a picture of desolation and gloom, I must acknowledge that a barren sea beach, skirted by an unbroken pine forest, echoing the roar of the Atlantic, is of all others the scene best calculated to wrap the heart in the mantle of despondency; the melancholy voice of the surge, the long line of dark woodland, the barren and unvarying sands, which bear nor flower nor tender herb, the

utter lifelessness which is scarcely relieved by the presence of a few sea birds conspire to impress the mind of the solitary traveller with the profoundest sentiment of loneliness and exile from communion with his kind. This picture may be occasionally relieved by the activity of the sandpiper, which follows the receding wave with the speed of Atalanta, hastily picks up the small shell-fish, and returns immediately, chased by the next billow, which spreads its thin, transparent sheet of water far up the echoing shore. The many coloured shells with which the storms ornament the sloping sands, also, in some measure, withdraw the mind of the naturalist from the contemplation of nature in her more savage aspect, but in other and happier scenes, when the voices of friends mingle with the sea breeze, and the musical laugh of merry girls contrasts with the solemn voice of ocean like the light tinkling of the sweet guitar blending with the organ's deep and measured tones; in such enchanting escapes from the throng of the hot city, and the monotony of home, who has not gazed with delight on those sea-born gems which are so elaborately wrought, and whose hues seem as though they had been painted by the Nereids in their coral cells; and yet how few contemplate them with any other view than the momentary pleasure experienced by the sight of their exterior beauty! Few perceive the links which bind them in a wonderful whole, all the minute gradations of which are preserved through the lapse of ages, with unerring skill, by animals so low in the scale of creation as scarcely to possess sensibility. Few reflect on the diversified habits of those creatures which construct such admirable ornaments for our cabinets—some, like the Pectens, swim near the surface of the sea by a rapid motion of their valves, and yet one of the same family, the Lima glacialis, either swims at will, or prefers to live immured in a solitary cell cut out of the solid rock, with merely a small aperture to let in the water, the light, and its necessary food; others, like the Hinnitæ, attach themselves to the surface of the most rugged rocks, closely resembling the oysters in their character and habits: many univalves prey on the living shells of other species, and by a peculiar secretion which dissolves the calcareous covering, they make a small, perfectly

round and smooth perforation, which gives access to the unfortunate animal within; many a specimen so drilled may be found by the attentive observer, and it is known to the residents on the coast that few epicures display more partiality for oysters than the little Fusus cinereus, which frequents their beds. Some shells, like the Mya and Solen, live deep beneath the surface of the sand which is bared by the receding tide; others, as the Chitons and Patellæ, attach themselves firmly to the rock or the stone on the beach, leaving no part of the animal exposed; the Anatifæ, on the contrary, are affixed by a fleshy peduncle, and often fringe the lost spar of a vessel, or the bottom of ships during long voyages in the Indian Ocean or the tropical seas. The Mytili adhere and are grouped together by a delicate byssus; some float from one region to another, and are frequently carried by ships from their native clime in the tropics to the colder shores of Great Britain; where the gulf stream has also wafted many a West India shell. Other species of Mytili congregate in vast numbers, and live half buried in the hard, grassy margins of the bays and estuaries, lashed firmly to each other by their byssus, and are there gathered by the fishermen for food. The purple Janthina floats, with a curious apparatus constructed for the purpose, and every one is familiar with the poetical history of the Nautilus, which spreads its thin sail to the favouring breeze, and is more secure than the proud ship, the only home of the human voyager—the Nautilus dreads no shipwreck, for,

> "He, when the lightning-wing'd tornadoes sweep,
> The surge is safe, his port is in the deep."

Many interesting observations may be made on the habits of the Testacea of our coast, and much is added to their attractions when we consult them as interpreters of geological phenomena. Thus, many of the species are fossilized, and grouped with others supposed to be extinct, or no longer living denizens of the sea, and the proportion of recent species to those exclusively fossil must determine the relative ages of strata in which they occur. As the ruins of ancient cities recall to the classic traveller, the memory of those nations and kingdoms passed

away, of which they are the time worn records, so the humble fossils over which the traveller now daily and unconsciously treads, speak of greater revolutions in nature, ere the mouldering column of remote antiquity was erected in its pristine beauty, yet less perfect in durability than a humble shell; showing that the least regarded work of nature will survive the wreck of man's proudest monuments, and link us with nearly all ages of the past, whilst the pride of art and the kingdoms of earth pass successively into utter oblivion.

The sea beach on the Carolina coast which I have alluded to, is described by Bartram in his usual graphic style. With the first signs of a road which led off from it, I proceeded through the forest, hardly expecting that so obscure a path should lead to a habitation of man; but a cabin at length was found, where from one of its pallid inmates I procured a vague direction to the nearest inn, which I was never destined to find. Indeed, it would require the clue of Ariadne to direct one through the labyrinths of this sterile uniformity of scene. The pedestrian, who traverses the low sandy region of the seaboard, meets with few objects of interest sufficient to reward his toil. If, when tired of wandering through the deep sand, he strikes into the woods, he will find the brown slippery pine leaves which carpet the ground an indifferent exchange for the highway. This most uninteresting country, however, enjoys a winter climate as lovely as a northern October, when the air is unvexed by storms. The pine forest is here and there varied in the low, moist, richer portions of soil, by a growth of oak, hickory, and a variety of less conspicuous trees, nearly every one of which wears a beard of Spanish moss which a Turk might envy, and on almost every limb, stripped of its panoply of leaves, the misletoe, as if in pity, hangs its emerald and perennial mantle. The swamps resound with the singular cry of the ivory-billed wood-pecker, and the pileated wood-peckers, with their crimson crests flashing like meteors, are seen chasing each other in frolic pastime around the grey trunk of the dismantled tree. Squirrels are arching their feather-like tails, and bounding in every direction around, or motionless on the boughs above, survey you with a keen and inquiring eye, whilst holding

to their mouths the untasted acorn or more savory nut; when his curiosity is satisfied, the graceful animal bounds a few paces, suddenly erects himself, and taking from his mouth the nut which he had been carrying, turns it impatiently in his paws, and with great vivacity commences his repast. You will now pause to hear the distant surf, which, however, is so blended with the similar roar of the pine woods when shaken by the wind, that you cannot separate sounds so intimately blended, for it seems as if the echo of the former had here made its permanent abode.

As a specimen of the kind of travelling which a passenger in the mail line may sometimes enjoy, I will here observe, that I was one day doomed to ride in a ricketty gig, one shaft of which had been broken, but was lashed together by a piece of rope; the horse was stone blind, and the road newly cut through the woods, elegantly veined with the roots, and ragged with the charred stumps of trees. "Well," observed the driver, who was a perfect Jehu in his profession, "We will try to clear the trees, but I cannot answer for the stumps." Away we started in a zigzag course, now bolting directly towards a tree on the side of the road, then a jerk of the reins, shooting us over to its opposite neighbour; a Scylla and Charybdis navigation; how we escaped the stumps it is in vain to inquire, but in this manner we safely reached the ferry, where a boat was in waiting to convey us to Georgetown, a village situated among extensive rice swamps which border the tide waters of Pedee river, and generate miasmata sufficient to kill the roses on the cheek of childhood, and to give the poor girls that aspect of disease which ought only to accompany the decline of age, for it is chilling to mark so dark a cloud in the bright heaven of youthful enjoyments. In life's earliest years Hygeia should be the handmaid of all, and the joy-lit eyes, not yet clouded by the cold reality, should beam only on a fairy world of enchantment, leaving the sadness of truth for maturer age, when one by one the frail links which bind and endear us to existence are broken, and we anxiously expect the messenger who is to conduct us through the portals of eternity, where Hope lingers to

offer us her parting benediction, promising unclouded serenity for the future and oblivion of the past.

Little do we reflect on the waste of life, or the pains of lingering disease, with all its train of concomitant evils, which the culture of rice has entailed on a portion of our population; Jefferson has wisely termed it a plant "which sows life and death with an equal hand." Raised in marshes protected from constant inundation by embankments along the river, it is necessary to flood the plant in order to bring the grain to maturity; thus artificial lakes of stagnant water exist through the heats of summer, and in the unwholesome season of autumn, in a climate peculiarly noxious, the waters are drawn off, and the slimy plains, reek with vapours, as poisonous as those of Avernus. In the winter they present a most dreary aspect, a dead level as far as the eye can reach, blackened by annual fires, but the scene is occasionally relieved by canals which intersect the fields, to which wild ducks resort in great numbers. The echo of the sportsman's gun may be heard in the distance, and the tall, dry, and yellow reeds beside you, which fringe the bank of the river, murmur as they bend to the impatient wind.

REPORT OF THE COMMITTEE APPOINTED BY THE GEOLOGICAL SOCIETY OF PENNSYLVANIA, ON A GEOLOCICAL SURVEY OF YORK COUNTY. Read October 29, 1834.

To the President and Members of the Geological Society of Pennsylvania.

The county of York is bounded on the east, north and west by the river Susquehanna, and Cumberland, and Adams counties, on the south by the state of Maryland. Indications of mineral deposits were here remarked at a very early period in our history. Copper was found by some of the followers of William

Penn in the township of Hellam, which was included in that portion of land set apart by him as his mining tract.

Two distinct ranges of mountains divide the county. The South Mountain, which is a most important range, takes its rise a little back of Dillstown, and continues on through Maryland, crossing the Potomac below Harper's Ferry; the Conewago hills are parallel, and have the appearance of belonging to the same system. The Pigeon and Round Top hills do not much deviate from an easterly and westerly direction. It is from the summit of the last mentioned hills, that the observer descries the distant and minor highlands, and can obtain a correct idea of the physical geography of this interesting district.

The two ranges mentioned, with their spurs, cause the streams that bathe their feet to be more rapid than if the country was less hilly or more gently undulating. The numerous falls that occur are of immense advantage to the manufacturing interests of the country; mill sites abound, several forges and iron smelting furnaces have been erected, and are now in active operation. The highly undulating surface of the country, and the strata of impervious schistose rocks, give rise to numberless springs.

That portion of the soil which is termed limestone land may be known on first sight, even when the rocks are not apparent, by the admirable order in which every thing appertaining to these farms is sustained. These lands were first settled by Germans, and their descendants retain them with a kind of religious attachment. The soil being naturally well adapted to the growth of wheat, and the farmer bestowing upon it all the labour requisite, is thus enabled to reap prodigious crops. The German farmer is characterised by his close industrious habits; and besides the prolific qualities of the earth, his great secret in farming is the quantum of labour bestowed upon a given portion, and this he could not do if he was possessed of too much, for one should never be mastered by the land; on the contrary the farmer should always rule his estate.

The slate land stands next in point of reputation, though in fertility far behind the former. The quality of the soil varies with the chemical composition of these transition rocks, which

form the basis of the soil; certain varieties are passably good, whilst others are wretchedly poor. Wonders have been effected within the last few years by the application of lime. It is as if some quickening fairy queen had waved her miraculous wand over these sometime since abandoned sterile grounds. Thousands of acres had been lying open as barren; dwelling-houses, barns, fences, &c. had been left by their owners to the dilapidations of weather and time; and they thus from the want of but one single simple scientific application were forced to quit their places of birth, the sites of frolic and youthful mirth, and seek an apparently less ungrateful soil in the far wilds of the lonely west. We might express the melancholy situation of this country in the language of the poet—

> "Now the sounds of population fail,
> No cheerful murmurs fluctuate in the gale,
> No busy steps the grass-grown footway tread.
> But all the blooming flush of life is fled."

By the application of lime these grounds have been regenerated, the population resuscitated, the smoke is seen gently curling from the cottage in the wood, the ploughboy's whistle, and the lowing herds that fill the land with health and prosperity, have risen as from the dead. This is a living example of what science might do, and speaks loud to those who are tardy in perceiving the advantages that would result from the scientific investigation of the manifold hidden resources of the state which now lie slumbering in their wealth.

Near Dillstown, in Monahan township, on the land of Col. Eichelberger, there exists a bed of marl, which might also be happily employed in ameliorating the composition of some unhealthy soils: it might be added alone, or mixed and used in compost.

The rocks that show themselves in York county are decidedly Transition. We observed no appearance of organic remains, in place: specimens of encrinites were shown us from the bed of the Susquehanna, but they were specimens that had been carried down by the river, and cannot be considered as characterizing any rocks that we saw in situ. At some former period

this district was the scene of violent eruption and dislocation. The direction of the strata from the schistose structure of the rocks runs from a few degrees north of north-east to as many south of south-west, lying vertical at different, though generally at highly inclined angles.

If we turn our backs upon the South Mountain leaving Dillstown, which stands near its base in Monahan township, proceeding on through Warrington, Dover, West Manchester on to York, we will cross in succession the following rocks, limestone, syenite, eurite, greywacke, greywacke slate, argillaceous schist, breccia, coal, and limestone upon which the city of York stands.

LIMESTONE.

This rock is frequently termed, and in truth is most known, as the blue limestone, from a frequent characteristic blue color. It however is sometimes yellow and white, and almost black; in this case I have found it to be coloured with carbonaceous matter. The yellow variety owes its colour to the presence of a small portion of the oxide of iron; it is usually compact, occasionally crystalline, and passes into marble. Veins of milky quartz are contained, and detached masses are seen scattered over the surface. This rock constitutes a portion of Monahan, Hellam, East Manchester, York, Paradise, Codorus, Heldeberg, and Manheim townships, forming a band which runs through the county from south-west to north-east, dividing the same into two pretty equal portions. In some of the adjoining states seams of limestone in concordant stratification are quarried and burnt for Hydraulic cement, with the composition of which you have already been made acquainted. The limestone of York county is burnt into lime, which is used for building, and as it contains no magnesia is employed for the uses of agriculture. This rock alternates distinctly with the schistose rocks of the transition series, and frequently passes insensibly into shales, without any apparent line of demarcation betwixt the two rocks. When the limestone becomes schistose it is called slate limestone; in this case there is always an insensible mixture with a different rock, the stratification being either straight or contorted.

In this formation there exists a cavern of considerable importance, situated at a short distance a little to the north of York; a branch flows in on one side, and reappears on the other side of the hill. There is also an opening into it from the top of the hill: a stone thrown in at this spot may be heard rumbling for a considerable time. The aperture below is too small for ingress, and owing to the precipitate descent from above, the only possible mode of gaining entrance would be by means of a rope from the summit.

FELSPATHIC AND AMPHIBOLIC ROCKS.

As you leave the limestone of Monahan township, and ascend those elevations known as the Round Top hills, the rocks change, and display an evident entritic character. The base of the rock, when sufficiently porphyritic as to distinguish the imbedded crystals, from the imbedding substance, appears to be of a petrosilicious nature, containing small dark brown or black crystals of amphibole. The base in this case predominates, and is compact, having a bright colour. It is often of easy decomposition, and is seen disintegrating at the surface of the earth; at other times, it is exceeding hard and tenacious, giving off sparks with steel, and resembling in appearance some of the Egyptian syenites, out of which sphinxes and other pieces of sculpture were formed, specimens of which may be seen in the public sculpture galleries throughout Europe, and in the gallery of the Louvre of Paris: again this rock changes, loosing its porphyritic structure, passing into a compact homogeneous, sonorous, and less tenacious blueish-gray, and even black mineral, thus passing into different traps, greenstones, and Lydian stones. These hills have every appearance of having once been a centre of dislocation and elevation, and may have been upheaved after the formation of the transition series. These porphyries and diorites being of phitonce origin, represent pre-existing rocks thus modified.

GRAYWACKE SCHIST.

This rock soon makes its appearance as you descend the Round Top hills, and disappears under the bed of the Conewago

creek. It has a dark blue colour, and is distinctly though not finely stratified, and follows the same direction as the phyllades of the transition series of this county, that is, from a few degrees to the north of north-east, to as many south of south of south-west. Its schistose structure is not evident in cabinet specimens, but it is distinctly stratified in mass. The graywacke slate of Hunterdon county, New Jersey, resembles this formation, except colour; at both localities they are characterized by nodules of epidote; in York this mineral is more abundant, it is massive green, and not so mixed with foreign matter as to mask its discriminating characters. The quality of this soil for agricultural process is indifferent, inferior to the limestone land, or that of the red argillacious slate.

GREYWACKE.

Immediately after crossing the Conewago creek the appearance of the earth changes, instead of a blue we have a dark red clayey soil, formed from the decomposition of the argillaceous schists which are seen alternating with, and always upon the confines of the sandstone, which predominates as you ascend the Conewago hills. It changes its aspect at almost every step; it is sometimes a hard ferruginous quartz rock, compact, white, red, gray, and of a variety of hues even to a black; at other times it is a well-characterised sandstone, with small crystals of hyalin quartz. The grains of quartz vary in size, and it passes into a conglomerate; the base being argillacious, red, with perceptible scales of mica, the imbedded pebbles are generally rolled quartz, varying from the size of a millet seed up. It is occasionally of a light colour, free from iron. The imbedded pebbles are uniform in size; the whole rock is hard, and employed in the county for making millstones for the various uses to which the Burr millstones are employed. Compact ferruginous varieties of the rock are used for gudgeons or boxes supporting the axis of water and other wheels; they are found to answer this end admirably well, and have superseded those of iron or steel. In building furnaces for the smelting of iron ores a proper hearth stone is considered a very great desideratum. The crucible is often built of bad materials, causing the furnace

to be put out of blast at very short intervals, to the very great loss of the proprietors. The campaign of certain furnaces in our country is called good if the hearth has resisted one year; we know of furnaces that have been in blast constantly for twenty years, and one of the principal causes of this astonishing success is undoubtedly owing to the very great attention that was paid to the choice of the hearth stones. We will not here discuss the merits of such materials, but let it suffice to say that the quartz rock of York county has the appearance of being well fitted for this purpose, and by a proper choice we think that superior hearth stones might be here procured, if not equal to those found and used in the Hartz mountains, much better than many we have seen used for these ends in the United States.

The greywacke quartz rock caps the summit of the generality of the highlands throughout the county, there are also hills entirely composed of it. The Pigeon hills, for instance, which run from the Susquehanna to Adams county, masses or boulders are to be met with on the surface of the ground at some distance from those localities where it is found in situ. At the river Susquehanna, between Marietta and Columbia, the quartz rock forms itself into several noble bluffs. The scenery here for miles along the river may be considered as remarkably fine, and many think it equally romantic with any in our country.

COAL.

Between the Little Conewago creek and the city of York, in the townships of East and West Manchester, a thin layer of coal has been discovered in several localities by those who have sunk wells for water. It was not, however, of sufficient thickness to arrest attention. At other localities fruitless attempts have been made to find coal, and we are sorry to perceive not only in this county, but in various directions through our country very many enterprising and worthy, but too credulous citizens have been led to expend, and frequently considerable sums in searching for this valuable combustible in those places where we might say, with some certainty, coal never will be found.

Our citizens have been so frequently imposed upon by pretenders who call themselves miners, or mining engineers, because they may have dug at Mauch Chunk, or at Pottsville, or in the coal fields of Europe—and having acquired a vocabulary of terms, go about the country proclaiming that coal may be found on particular estates, and that the only reason why it has not been found is because they have not dug deep enough, or that the granite should be pierced, or, in fine, that there is coal where in the very nature of things coal could not exist. Their confidence induces the farmer thus to bury his hard earned money, and it is not until he has been duped by these spurious individuals, that he has discovered his mistake. Nor is this abuse alone confined to the searching after coal, the whole alphabet of metals may be found by a branch of hazlewood, when in the hands of the gifted pretender. We cannot cry out too loud against these charlatans, and unworthy, ignorant offenders. The facility with which these impostors deceive, arises out of the difficulty in our country of acquiring scientific information of a certain kind. The arts of mining and metallurgy are of difficult acquisition every where; they require a great deal of profound theoretical knowledge, and very close practical observation; consequently they are by no means intuitive, and can only be purchased by long, laborious, and indefatigable exertions, not from books alone, but from the living school where the play of nature has been exposed to view, with the economy of art, where the furnace has taken the place of the crucible; nor is theory less useful, it is a glorious light which serves to conduct the operative through the dark labyrinths of practice.

BRECCIA.

On the confines of the blue limestone, which reappears a few miles to the west of York, there is found a breccia composed of a red argillacious cement, and masses of older rocks. The imbedded masses are of various sizes, and the majority of them are limestone, proving its age in relation to the limestone rock. This breccia has a very pretty effect when polished, and might be used for the same purposes as are the common marbles. It continues on, and is seen at the Susquehanna not far from Yorkhaven. You are all acquainted with that beautiful pudding

stone, out of which the columns that ornament so richly one of the halls in the capitol at Washington have been made. This rock is precisely similar, and like that found on the banks of the Potomac is known in York county, and throughout the United States, as the Potomac marble.

TRAUMATES.

We will pass over in silence the limestone upon which York is located, it having been already described. In journeying in any direction, after leaving the city, from south-west to south-east, you will shortly come to the traumates of D'Aubuison, phyllades and transition slates of other geologists. These schists are characterized by a more perfect stratification than other rocks in the county; they are straight, undulating and inclined, and folllow a general direction with the other formations; that is to say, nearly north-east and south-west; the layers are divided into a multiplicity of differently characterized strata, having all the variations of texture, composition and color, disintegrating at the surface into small, variously shaped pieces, and giving various colored powders. Clay or argile is evidently sometimes the most abundant constituent; chlorite predominates, and the aspect changes, as also the texture, and form a chlorite slate; the talc prevailing, a talcose slate well characterized appears, a greenish hue denotes the presence of either, and it is difficult to say whether the chlorite or the talc most abounds. At certain times, however, and in certain localities, the talcose slate is apparently free from chlorite, and is of a reddish hue, from the oxide of iron, and divides into laminæ, which have that particular satin lustre that accompanies magnesian rocks. There is a seam of red talcose slate that runs through the townships of Windsor, York, Shrewsbury and Codorus, into the state of Maryland; the width of this slate varies, and passes into chlorite slate, argillaceous slate, and a variety of slates, badly defined or characterized, and varying as either of the constituents prevail. These rocks as the rest, run nearly a north-east and south-west course. Ferruginous quartz is found upon the surface of the ground, and occurs in veins traversing the laminæ, and at other times seams of quartz run parallel with the strata, and between the leaves

of the same, at places, the quartz is swollen out and gradually diminishes so as to almost disappear, assuming somewhat the form of a lentille. This the German miners term liegende stock, an example of which we have just endeavored to describe may be seen on the Baltimore road, in Shrewsbury township, on the side of a hill, near a public house known once and marked on the maps of the county, as Wilson's tavern. Veins of quartz are common to this formation; the quartz is more or less ferruginous and frequently cavernous; sometimes it contains hæmetitic oxide of iron, at others the peroxide, impregnating the whole and encrusting the caverns; appears to have come from the decomposition of pyrites. In some cases the iron pyrites have undergone no change, and are of the varieties yellow and white. Cubic crystals of this mineral are found imbedded, and may be found upon the surface of the soil; after a rain in small washes they may be collected with ease and sometimes in abundance. The ferruginous, cavernous or drusy quartz that is found in veins, in the talcose, or contiguous rocks, is often so friable as to be crumbled by pressure with the hand, its structure becoming schistose, a mixture with surrounding rock is apparent. The roads are mended with this mineral, and, as we have observed, it is common upon the surface of the ground in all directions in the neighborhood of these talcose, chlorite, argillacious schist and limestone formations. These rocks, as also do the contained quartz, bear a very strong resemblance to those of the gold belt of Georgia, North and South Carolina, and Virginia; and so great indeed is the analogy between specimens of auriferous quartz from the several southern states and those of this county, as not to be distinguished but by reference to the label. My friends, Mr. Calvin Mason and Dr. Fisher, of whom I speak with a lively feeling of pleasure, remembering with gratitude their polite attentions to me whilst in York, these gentlemen, after frequent and close research, have discovered gold in quartz at different times and different localities within the limits of the formations we have just had the honor to describe.

No mines have yet been worked for gold in this county, and it was owing to the above named gentlemen having found some particles of this precious metal in quartz, that a loose no-

tice gained its way into some of our public journals. A short distance above Columbia, on the Susquehanna, and in the county of Lancaster, a horizontal drift has been run into that hill known here by the name of Chicky's rock. This work is of trifling importance, not being in length above fifteen feet; it was then abandoned; some ore lay at the mouth of the work, and that which was pointed out to me as being good, was a heterogenious mixture of chlorite, quartz, oxide of iron, feldspar &c. The gentleman who had superintended these workings informed me that the quartz here found contained sufficient gold to pay and yield. He was then engaged in researches for auriferous quartz, in the vicinity of Keysie's ferry, in Hellam township. The country hereabout is rugged and romantic, the rocks back of the ferry exhibit indications of copper, and the gentleman who caused to be assayed many specimens of quartz found in this vicinity, discovered the gold to be most abundant in and about those places where the iron and copper met, or where different rocks came together, deranging the regularity of the quartz veins. I have also been informed that the iron ores of this county,—we speak of those near or in the limits of the gold range,—all contained gold. The presence of gold is by no means as rare an occurrence as many believe, for many sands used for making glass contain a small quantity of this metal; so little indeed is the proportion as only to be sensible by long accumulation from large quantities of sand, made evident in the manufacturing of glass. The crucibles used for containing the liquid salts, after having served for months this end, are cast off. On examination, small portions of gold have been found in the bottom of the vase. The discovery of the presence of this metal is of no importance; it is the proportion only that must be considered, and this must vary with the nature of rock, the surface of country, and a multiplicity of other considerations which grow out of the nature and mutability of things. Our object here was not to examine into the relative richness of any particular part or locality of this district, but to enable those to judge from a description of the whole, the nature of these formations when compared with those that characterize certain parts of those states in which gold has been found in sufficient abundance to

interest capitalists, and which has now long since been an object of public attention. From the imperfect descriptions we have given, you will judge these formations to be similar. Gold has been found in quartz, visible to the eye, and when in too minute particles to be discovered by occular inspection, it is nevertheless frequently possible to separate, with advantage, the gold by chemical means.

The specimens of minerals and rocks of this country we expected to receive ere this; had they arrived, we should now have offered to the society the results of chemichal examination; however, we place but little value upon the results of such examinations; assays of individual specimens are by no means just expressions of the whole, still we hope shortly to furnish these results to those who desire them.

Of the prevalent rocks that are found in the lower portion, or south-east part of the county, we can say but little, not having had occasion to visit the same, but judging from specimens shown us. The hills near the Susquehanna appear to be composed principally of shining argillite or glimmer sheiffer. There is a fine quarry of slate in the township of Peachbottom; the quality of this useful mineral is very good, and is much used throughout this and the adjoining counties, for roofing slate.

We subjoin a partial list of mineral species found in this county; it cannot but be imperfect, but may answer for a commencement:

QUARTZ.—Hyalin, milky, ferruginous, drusy, auriferous, massif, Lydienne, prase.

Colophonite, garnets, wavelite, chlorite, epidote, pipe clay, haloysite, talc, amphibole, mica, feldspar;

Carbonate of lime, white, yellow, blue, &c.

Marl.

Oxides of iron—octohœdral crystals of, and micacious, magnetic, hœmetitic.

Sulphuret of iron.

Copper—native, red oxide, carbonate, sulphuret.

Gold—native.

Lead—sulphuret.

The ostensible object of the author's visit to the county of

York, was to examine "the gold region and gold mines." How far this end has been attained, you are the better judge. Having tarried a much shorter time than our desires would have dictated, we were prevented from examining in detail the entire mineral riches of this interesting district; still, we have endeavored to pourtray the leading geological features of the county.

Owing to a misunderstanding between the editor and printer, the author had not an opportunity of correcting the first six pages of this extract; they were consequently struck off with many errors. Much to his surprise, he found these desultory observations honored with the far too dignified title of "Geological Survey" &c.

ERRATA.—Instead of "Report of the Committee appointed" &c., read, *Extracts from a paper read before the Geological Society, entitled, Observations on the Geology of York County, Pa., by Thos. G. Clemson; printed in vol. i. part 2d, of the Transactions of the Geological Society of Pennsylvania.*

Page 163, instead of "the county of York is bounded" &c., read, *the county of York is bounded on the north and east by the river Susquehanna and the county of Cumberland, on the west by Adams county, and on the south by the state of Maryland.*

Page 165, line 5, instead of "some time since," read, *long.*

Page 166, line 2, read, *the direction of the strata of these schistose rocks is from*" &c.

Page 166, line 23, instead of "Heldeberg," read, *Heidleberg.*

Page 166, lines 29 and 30, instead of "and of containing no magnesia is" &c. read, *it contains no magnesia, and is,* &c.

Page 166, line 28, after "acquainted," there should have been an asterisk referring to a note below, which should have run thus: *See T. G. Clemson's paper on the analysis of divers mineral substances—Journal of the Franklin Institute.*

Page 167, line 2, instead of "situated," read, *situate.*

Page 167, line 5 from bottom of page, instead of "phitonce," read, "Plutonic."

Page 168, line 7, read *except in color.*

T. G. CLEMSON.

JOURNAL OF THE WEATHER FOR JULY, 1834.

Moon.	Day's no.	Ther. Sunrise	Ther. Mid-day	Ther. 11 P. M.	Barometer. Sun-rise	Barometer. Mid-day	Barometer. 11 P.M	Winds. Morn-ing	Force	Winds. After-noon	Force	Winds. Even-ing	Force	Clouds. Course of clouds	Rain	Observations.
	1	61	83	70	29.95	29.95	29.95	SSW	2	SSW	1	S	1	NNW		Clear—aurora
	2	72	83	76	.82	.80	.71	SSW	1	SW	1	W	3	WSW	.30	Partly clear—2 th. gusts
	3	70	82	73	.70	.70	.70	NW	2	N	2	S	0	SSW	.04	Partly clear—rain
	4	69	80	72	.78	.78	.80	NNE	1	S	0	NNE	1	SW	.05	Cloudy—rain.
	5	69	82	73	.80	.80	.80	NNE	1	S	0	N	0	NNE	.90	Rain—partly clear
	6	71	87	77	.80	.79	.78	SSW	1	SW	1	SW	0	SW		Foggy—clear
	7	75	89	76	.75	.75	.75	NW	1	N W	2	SW	0	SW		Foggy—clear
●	8	74	92	80	.75	.75	.75	SW	1	SW	1	W	0	W		Clear
	9	76	90	77	.80	.79	.78	SW	1	SSW	3	SSW	1	NW		Clear.
	10	75	88	73	.75	.80	.75	SW	2	N	4	NNE	2	S		Partly clear.
	11	66	79	65	.80	.88	.90	N	2	N	2	N	1	W		Partly clear
	12	63	79	68	.78	.85	.90	E	3	E	3	E	3	WSW	.05	Cloudy—rain—clear
	13	63	75	68	30.00	30.00	30.00	NE	3	NE	3	NW	0	E by S		Clear
	14	66	87	77	.05	.10	.10	W	2	SW	2	SW	1	SW		Partly clear.
	15	73	88	78	.04	.00	.00	SW	3	SW	3	SW	0	W		Partly clear.
	16	74	88	76	29.94	29.90	29.85	SW	1	SW	1	SW	0	WNW		Partly clear.
	17	73	87	69	.85	.80	.87	SW	2	NW	4	NE	1	WNW	.85	Partly clear—th. gust
	18	66	75	62	.98	30.05	39.10	E	2	NE	1	NNE	1	SW	.10	Cloudy—rain—clear
	19	60	77	59	30.20	.18	.18	ENE	2	N	1	N	1	SW		Mostly clear.
	20	58	78	68	.12	.08	.05	E	1	S	0	SSW	1	W?		Clear.
○	21	65	83	73	.08	.00	30.96	SSW	1	SSW	1	SW	1	E		Mostly clear
	22	68	88	74	29.87	29.85	.82	N	1	NNW	1	NNW	1	NW		Clear.
	23	73	88	76	.87	.85	.84	NE	1	SW	1	NW	1	W?		Mostly clear.
	24	72	91	69	.85	.81	.80	SSW	1	NNW	4	NW	1	NW	.30	Mostly clear—th. gust
	25	68	88	77	.82	.80	.80	N	1	SW	1	W	0	?		Clear
	26	75	91	80	.81	.80	.81	WSW	1	WSW	2	NW	1	NNW		Clear
	27	76	93	81	.82	.80	.81	NW	2	NW	2	N	2	WSW		Clear
	28	73	87	76	.88	.90	.86	NNE	1	N	1	S	1	W		Clear
☽	29	70	80	70	.85	.85	.88	NW	4	SE	1	N	1	NE	5.10	Deluge of rain—clear
	30	60	76	65	.90	.92	.98	NE	1	SSW	1	S	2	W?		Clear
	31	66	80	66	.85	.81	.79	E	1	SW	1	NE	0	SW	.20	Partly clear—th. shower.

SUMMARY.

Average at sunrise, thermom.		69°13	—barom.	29.88	inch.
Do.	mid-day,	do.	84°48	do.	29.875	do.
Do.	11 P. M.	do.	72°39	do.	29.873	do.
Monthly average,		do.	76°855	do.	29.878	do.
Maximum (27th)		do.	93°	do.(19th)	30.20	do.
Minimum (20th)		do.	58°	do. (3rd)	29.70	do.
Range		do.	35°	do.	50	do.

Warmest day (27th)	do.	84°50
Coldest day (20th)		68°
Proportion of clear weather, ...		21 days
Do. cloudy	do.	10 "
Whole days clear	do.	14 "
Days on which rain fell		10 "
Quantity of rain		7.89 inches.
Northerly winds prevailed (proportion) .		9 days
Easterly do.	do. do.	6 "
Southerly (S. to W.)	do.	16 "

Observations.—An aurora borealis on the 1st, followed in three days by a slight easterly storm, and by very hot weather. Clouds very frequently electrified, lightning being visible on 22 days. Six complete thunder gusts. Three easterly storms, all slight, and accompanied with rain. Rains seasonable, and moderate, except that of the 29th, which was heavy without a parallel in the memory of the oldest inhabitants. It commenced with a thunder gust at 5 o'clock in the morning, and poured down in torrents till 7½, when it ceased. In this short time of two and a half hours, more than 5 inches of water fell! The streams were much swollen for a little while, and the roads and turnpikes were excessively washed. The rain did not extend farther than 10 or 15 miles from Wilmington in any direction, except, perhaps, in an easterly course in New Jersey. It was followed by a severe drought. The winds in the month were moderate, except during thunder gusts, and exceedingly variable in their course. The temperature was almost uniformly warm, or rather hot. The 27th was the hottest day for a number of years, the mercury being at 93° at mid-day, in the coolest possible situation, where there was a free circulation of air. Perhaps it does not exceed this elevation in our climate more than once in fifteen years on an average. The heat of this month was rendered the more insupportable by the large proportion of cloudy and damp weather.

JOURNAL OF THE WEATHER FOR AUGUST, 1834.

Moon.	Days mo.	Ther. Sunrise	Mid-day	11 P. M.	Barometer. Sun-rise	Mid-day	11 P.M	Winds. Morn-ing.	Force	After-noon	Force	Even-ing.	Force	Clouds. Course of clouds	Rain	Observations.
	1	63	80	69	29.82	29.82	29.82	NE	1	S	1	SE	1	SW		Clear
	2	66	83	68	.87	.85	.85	E	1	E	1	S	1	WSW		Mostly cloudy
	3	65	82	69	.90	.93	.95	SE	1	SSW	1	E	1	SW		Clear
	4	67	84	71	.90	.87	.85	ENE	0	ENE	0	NE	0	W?		Clear—hazy
	5	68	87	75	.82	.80	.78	SW	0	W	1	NNW	0	WSW		Clear—hazy
	6	72	86	73	.80	.82	.82	NNW	1	NNW	1	NNW	0	W?		Clear—hazy
	7	71	88	74	.82	.80	.75	NW	1	W	1	N	0	N		Clear—hazy
	8	71	89	73	.72	.71	.70	NW	1	N	2	N	1	W		Mostly clear—hazy
	9	67	87	76	.71	.71	.71	NNE	1	S	1	N	1	NNW	.55	Clear—cloudy—show.-t&l.
	10	70	86	73	.70	.70	.70	N	1	SE	1	N	0	WSW		Partly clear
	11	72	88	77	.72	.72	.75	SW	2	NNW	2	NE	0	WSW	.05	Mostly clear—shower
	12	75	92	80	.75	.73	.72	W	2	SW	2	NW	4	SW		Clear
	13	75	87	75	.73	.73	.79	NW	2	NW	1	NE	1	WSW		Mostly clear
	14	72	86	78	.79	.70	.61	E	1	SW	1	W	1	W		Clear
	15	71	80	68	.67	.67	.67	NW	4	NW	2	NNW	2	NNW		Clear
	16	61	77	65	.74	.82	.90	N	3	N	3	S	0	WSW		Partly clear
	17	66	80	67	.95	.94	.85	SW	2	SSW	3	SW	2	NNW		Clear
	18	68	86	68	.75	.74	.76	W	2	NNW	2	N	2			Clear
	19	58	77	66	.78	.78	.78	N	2	NNE	2	S	2			Mostly clear
	20	64	77	67	.78	.78	.78	NNE	2	NE	2	S	1			Mostly cloudy
	21	61	78	66	.77	.77	.77	NW	1	NW	2	NNE	2			Clear
	22	60	81	66	.79	.80	.80	NNW	1	NW	1	W	0			Clear
	23	63	84	68	.80	.80	.80	W	1	SW	1	S	0			Clear
	24	64	85	68	.80	.80	.78	SW	1	NW	2	N	3			Clear—cloudy—shower
	25	63	75	61	.80	.81	.85	NNW	2	NW	1	N	1	NW		Clear
	26	57	76	61	.89	.88	.90	NE	1	NW	1	NW	0	W		Cloudy—clear
	27	59	75	59	.94	.95	.95	E	2	W	1	E	1	W		Mostly clear
	28	56	76	61	30.02	30.02	30.02	F	1	ESE	2	NE	1	SW		Cloudy—clear
	29	59	78	60	.03	.00	.00	NE	2	ENE	2	NE	1	SW		Clear
	30	59	76	61	.00	29.98	29.95	ENE	2	E	2	ENE	2	SW		Cloudy
	31	60	75	66	29.95	.93	.90									

☞ The foregoing observations on the thermometer, barometer, and winds, are taken three times a day; at sunrise, mid-day and 11 P. M. In the column representing the force of the wind, 0 denotes calm or nearly so, 1 a light breeze, 2 a breeze, 3 a wind, 4 a high wind, and 5 a very high wind. The two additional columns denote the direction in which the clouds were observed to move; the former column referring to the upper stratum of clouds, and the latter to the lower, when two different strata were visible.

SUMMARY.

Average at sunrise, thermom.	65°26	—barom.	29.823	inch.
Do. mid-day,	do.	81°97	do.	29 818	do.
Do. 11 P. M.	do.	68°68	do.	29.813	do.
Monthly average,	do.	73°615	do.	29.820	do.
Maximum (12th)	do.	92°	do.(29th)	30.03	do.

Minimum (28th)	thermom.	56°–barom.(14th)	29.61	inch
Range,	do.	36° do.	.42	do.
Warmest day (12th)	do.	83°50		
Coldest day (28th)	do.	66°		

Proportion of clear weather, ...	24 days.
Do. cloudy do.	7 "
Whole days clear, ...	18 "
Days on which rain fell, ...	3 "
Quantity of rain, ...	0.65 inches.
Northerly winds prevailed, (proportion,)	12 days
Easterly do. do. do. . .	10 "
Southerly, do. do.	9 "

Observations.—No auroras. Clouds electrified on 8 days, but no complete thunder gusts. No complete easterly storm; an abortive one on the 2nd, and the commencement of one on the 31st. Rain fell on three days only, and even then in small quantities. Vegetation suffered much on account of the drought. The crops of Indian corn and late potatoes were much injured, and in some places nearly destroyed. Winds mostly light, but not very changeable. Temperature very uniformly hot in the former half of the month, but much cooler during the remainder. For the first 15 days the mercury was not below 80° at noon. The summer of 1834 was a hot summer in Europe, as well as in our own country.

On the evening of the 10th of this month, and until it became cloudy next morning at 4 o'clock, an unusual number of brilliant meteors were visible. Their course at first was from north to south, and afterwards from east to west. Two or three were sometimes observed in a minute. On the night of the 11th they were again visible. I find by an account in some of the newspapers, that the same phenomenon was observed at Cincinnati, Ohio, on the same nights.

THE SAFETY LAMP.

THE whole range of the coal fields of England has been estimated to extend over a surface of 180 square miles; and the number of different beds of coal to exceed 40. Dr. Thompson calculated that the quantity of coal yearly exported from this formation exceeds 2,000,000 of chaldrons of 2,000 pounds each, according to the standard of English measure; thus making upwards of 2,000,000 of tons of coal which are extracted every year from the mines of Britain. At the present rate of mining he thinks it may be fairly stated, that they will continue to supply coal for 1000 years to come.

From this statement it may be estimated how extensive those excavations must be at the present time; one of the deepest, which is under the lake of Jarrow, 5 miles from the Tyne, is 1200 feet below the surface of the earth. In some collieries the workmen must traverse the tortuous pathway in the mines for forty or fifty minutes, going miles before they arrive at their working place. During this time, as well as that which they are engaged in working, they have no intercourse with the world above.

Machinery, however, has been constructed for the purpose of ventilating every part of the mines, even to the old excavations, which are technically called *wastes*. This is performed by placing furnaces at the bottom or top of the upcast shaft. In an extensive establishment a powerful air pump, working by steam, is employed to quicken the draft, which draws out from the mines a thousand hogsheads of air every minute. Though apparatus of this kind cannot prevent the dangers of fire damp, yet it furnishes wholesome air to the miners.

It was at the solicitation of Dr. Gray, chairman of the committee appointed by the society for preventing accidents in coal mines, that Davy first directed his attention to the investigation of this highly interesting subject.

Having been supplied by Mr. Buddle with various specimens of fire-damp, he informed Dr. Gray, in less than a fortnight after, that he had discovered new and unexpected properties in the gas, which had led him to no less than four different me-

thods of lighting the mines with safety. He found fire damp to be, as had been always supposed, a hydro-carbonate. A chemical combination of hydrogen gas and carbon, in the proportion of 4 by weight of hydrogen gas, and 11½ of carbon; that it will not explode if mixed with less than six times, or more than 14 times its volume of atmospheric air; its greatest powers of explosion was that of 7 or 8 parts of air to 1 of gas. That air, when rendered impure by the combustion of a candle, but in which the candle will still burn, will not explode the gas from the mine; that when a lamp or candle is made to burn in a close vessel, having apertures only above and below, an *explosive mixture* of gas admitted merely enlarges the light, and then gradually extinguishes it without explosion: and that the gas mixed in any proportion with common air *will not explode in a small tube* the diameter of which is less than an eighth of an inch, or even a larger tube, if there is a mechanical force urging the gas through this tube.

Explosive combinations of this gas with air require much stronger heat for their explosion than mixtures of common inflammable gas. Thus, *olefiant gas*, when mixed with such proportions of common air as to render it explosive, is fired both by charcoal and iron, heated to a dull red heat. It is the same with *gaseous oxide of iron* and *sulphuretted hydrogen*. Red hot charcoal, made so as to burn without flame, if blown upon by a mixture of the mine gas and common air, does not explode it, but gives light in it.

A fire made of this kind of charcoal was urged to whiteness by an explosive mixture containing the fire-damp, without producing its inflammation. And an iron rod, heated to a *white* heat, did not inflame mixtures of the fire damp; but it did when in brilliant combustion. Heat produced by the combustion of fire damp was much less than that occasioned by most other inflammable gases under similar circumstances; hence its explosion was accompanied with comparatively less expansion: a circumstance of obvious importance in connexion with the propagation of its flame.

The first method which these discoveries suggested of lighting mines, was by the *safe lamp*, in which a candle or lamp

burns in a safe lantern, air-tight in the sides, with tubes below for admitting air, a chamber above, and a chimney for the foul air to pass through; this is as portable as a common lantern, and but a trifle more expensive. But as the light never burns in its full quantity of air, it is more feeble than a common candle.

The second was the *blowing lamp.* In this the candle or lamp burns in a close lantern, having a tube below of small diameter for admitting air, which is thrown in by a small pair of bellows, and a tube above of the same diameter, furnished with a cup of oil. This burns brighter than the other, and is extinguished by explosive mixtures of the fire damp, and the candle may be made to burn in it as bright as if in the open air.

The third is the *piston lamp*, by which air is thrown in by means of a piston, without any communication between it and the external air.

These lamps are all extinguished when the air becomes so polluted with fire damp as to be explosive.

The fourth is the *charcoal lamp*, by means of which blowers may be examined in air in which respiration cannot be carried on. This consists of a small iron cage on a stand, containing small pieces of *very well burnt* charcoal, kept at a red heat. This lamp will not inflame any mixtures of air with fire damp.

In addition to these he constructed another, which he called the *fire-valve lantern.* The lamp burnt with its full quantity of air admitted from an aperture beneath, till the air began to be mixed with fire damp. When, as the fire damp increased the flame, a thermometrical spring at the top, made of brass and steel rivetted together, and in a curved form, expanded, moved a valve in the chimney, diminished the circulation of air, and extinguished the flame.

Subsequent experiments developed other properties of the fire damp than those enumerated, the consequence of which was that a method of constructing safe lamps was brought into view, more simple than any which had before been suggested.

It was ascertained by Davy that the quantity of air necessary to be mixed with the gas, in order to produce an explosive

mixture, was very considerable. Even when combined with three or four times its bulk of air, it burnt quietly in the atmosphere and extinguished a taper. When mixed with five or six times its volume of air, it exploded freely. The mixture which seemed to possess the greatest explosive power, was that of seven or eight parts of air to one of gas. On adding azote and carbonic acid in different proportions to explosive mixtures of fire damp, it was observed that even in very small quantities these gases diminished the velocity of the inflammation, or altogether destroyed it. In this stage of the inquiry, the important fact was discovered, that explosive mixtures could not be fired in metallic tubes of certain lengths and diameters. Mr. Tennant had observed this same fact several years before: but Davy was not aware of it at the time of his researches.

In exploding, for instance, a mixture of one part of gas from the distillation of coal and eight parts of air, in a tube of one quarter of an inch in diameter and a foot long, more than a second was required for the flame to reach from one end of the tube to the other; and no mixture could be made to explode in a glass tube one-seventh of an inch in diameter. In pursuing these experiments, he found that by diminishing its diameter he might in the some ratio shorten the tube without danger, and that the same principle of security was obtained by diminishing the length and increasing the number of the tubes, so that a great number of small apertures would not pass explosion when their depth was equal to their diameter. This fact led him to experiments on sieves made of wire gauze, or metallic plates perforated with numerous small holes; and he found that it was impossible to pass an explosion through them. The apertures of the gauze should not be more than one-twentieth of an inch square. As the fire damp is not inflamed by ignited wire, the thickness of the wire is of no importance. In some lamps which were made by a mechanic who did not understand their scientific principle, accidents frequently occured from their use. On examination it was found that the apertures were too large; yet so small was the difference between them and good lamps, that by a common eye it could scarcely be distinguished.

In reasoning upon these several phenomena, it occurred to

Davy, that as a high temperature was required for the inflammation of the fire damp, and as it produced in burning, comparatively but *a small degree* of heat, the effect of carbonic acid and azote, as well as that of the surfaces of small tubes, in preventing its explosion, depended upon their cooling powers; that is to say, upon their lowering the temperature of the exploding mixture to such a degree, that it was no longer sufficient for its continuous inflammation. In support of this theory he ascertained that metallic tubes resisted the passage of the flame more powerfully than glass tubes of similar lengths and diameters, metal being the better conductor of heat; and that carbonic acid was more effective than azote in depriving the fire damp of its explosive power, in consequence, as he considered, of its greater capacity for heat, and likewise of a higher conducting power connected with its greater density.

This short statement contains the whole theory and operation of the safety lamp, which is nothing more than an apparatus by which the inflammable air, upon exploding in its interior, cannot pass out without being so far cooled as to deprive it of the power of communicating inflammation to the surrounding atmosphere.

From the result of these researches it became evident, that to light mines infested with fire damp with perfect security, it was only necessary to use air-tight lanterns, supplied with air from tubes of small diameter, through which explosions cannot pass, and with a chimney on a similar principle, at the upper part to carry off the foul air.

The most improved lamps which Davy invented were framed from wire gauze, in the place of his tubes or safety canals. The happy idea of constructing them altogether of gauze, did not occur to him till several weeks had elapsed after the construction of the others. The original lamp was perfectly safe in the most explosive atmosphere, but its light was necessarily extinguished by it; whereas, in the wire gauze cage, the fire damp itself continues to burn, and thus to afford to the miner a useful light, while he is equally secured from the fatal effects of explosion.

All, then, which is required for his guidance and protection

in the darkness of the mine, are candles or lamps surrounded by small wire cages, which will at once supply air to the flame, and light to the miner: below is a sketch of one.

A, a cylinder of wire gauze, fastened to the brass rim B, which screws on to the lamp C. The whole supported by strong iron supports D.

The curious phenomenon which Davy discovered, in the course of his experiments, of slow combustion without flame, is well worthy a remark. He observes, that there cannot be a better mode of illustrating this fact, than by an experiment on the vapor of ether or alcohol. Let a few coils of wire of platinum of the one-sixtieth or one-seventieth of an inch, be heated by a hot poker or candle, and let it be brought over the glass containing the fluid; it will rapidly attain almost a white heat, and will continue so, as long as a sufficient quantity of vapor and of air remain in the glass. This principle has been applied for constructing what is called the *aphlogistic lamp*, which is formed by placing a small coil of platinum wire round the wick of a

common spirit lamp. When the lamp is blown out after being lighted for a few moments, the wire continues to glow for several hours, as long as there is a supply of spirit of wine, and to give light enough to read by. Spirit of camphor will produce the same phenomenon. It is thus the miner will be supplied with light in mixtures of fire damp no longer explosive. For should his flame be extinguished by the quantities of fire damp, the little coil of platinum will begin to glow with a light sufficiently bright to guide him in what would otherwise be impenetrable darkness, and lead him into a purer atmosphere, when the heat thus increased will very frequently be sufficient to rekindle his lamp! Davy attempted to produce the phenomenon with other metals, but he succeeded only with platinum and palladium: these bodies have low conducting powers, and small capacities for heat, in comparison with other metals, which seem to be the causes of their producing, continuing, and rendering sensible these slow combustions.

In this case it will be perceived that the combustion of the fire damp is continued so slowly, and at so low a temperature, as not to be adequate to that ignition of gaseous matter which constitutes flame, although it excites a temperature sufficient to render platinum wire luminous.

Sir H. Davy observes that there never can be any danger with respect to respiration, whenever the wire continues ignited, for even this phenomenon ceases when the foul air forms about two-fifths of the volume of the atmosphere.

The honor of this grand discovery was contested for a considerable time by a man of the name of Stephénson, an engine-wright, of Killingworth—a person not even professing a knowledge of the elements of chemistry. The controversy was carried on for a considerable time, but his claims were ultimately proved to be false. A splendid set of plate was presented to Sir Humphrey by the British coal dealers. In 1825 he had the honor of receiving from the emperor Alexander of Russia, a superb silver gilt vase, standing in a circular tray enriched with medallions. On the cover was a figure sixteen or eighteen inches high, representing the god of fire weeping over his extinguished torch.

There are many other very interesting details relating to the subject of the safety lamp, which we must necessarily omit for want of room.

"Sir Humphrey Davy commenced, as we have seen, with ascertaining the degree of combustibility of the fire damp, and the limits in which the proportions of atmospheric air and carburetted hydrogen can be combined, so as to afford an explosive mixture. He was then led to examine the effects of the admixture of azote and carbonic acid gas; and the result of those experiments furnished him with the basis of his first plan of security. His next step was to inquire whether explosions of gas would pass through tubes; and on finding that this did not happen, if the tubes were of certain lengths and diameters, he proceeded to examine the limits of such conditions, and by shortening the tubes, diminishing their diameters, and multiplying their number, he at length arrived at the conclusion, that a simple tissue of wire-gauze afforded all the means of perfect security; and he constructed a lamp, which has been truly declared to be as marvellous in its operation, as the storied lamp of Aladdin, realizing its fabled powers of conducting in safety, through 'fiends of combustion,' to the hidden treasures of the earth. We behold a power which, in its effects, seemed to emulate the violence of the volcano and the earthquake, at once restrained by an almost invisible and impalpable barrier of network—we behold, as it were, the demon of fire taken captive by Science, and ministering to the convenience of the miner, while harmlessly fluttering in an iron cage.

And yet, wonderful as the phenomenon may appear, his experiments and reasonings have demonstrated, that the interruption of flame by solid tissues permeable to light and air, depends upon no recondite or mysterious cause, but simply upon their cooling powers, which must always be proportional to the smallness of the mesh, and the mass of the metal.

When it is remembered that the security thus conferred upon the laboring community, is not merely the privilege of the age in which the discovery was effected, but must be extended to future times, and continue to preserve human life as long as coal

is dug from our mines, can there be found in the whole compass of art or science, an invention more useful and glorious?

The wire-gauze lamp has now been several years extensively used in the mines, and the most satisfactory and unequivocal testimonies have been published of the complete security which it affords. They have amongst the miners obtained the name of *Davys;* and such is the confidence of the workmen in their efficacy, that by their aid they enter the most explosive atmospheres, and explore the most remote caverns, without the least dread of their old enemy the *fire damp.*"

ON CLASSIFICATION AND NOMENCLATURE.

In contemplating the study of the sciences, classification and nomenclature present themselves at once to view. To the mind of the uninitiated and unreflecting, the former often assumes the appearance of embarrassing and useless ceremony; and the latter is liable to be regarded as a formidable obstacle, equally extraneous and unnecessary. I propose to offer a few remarks on these subjects, chiefly designed for young persons who may engage in scientific pursuits.

Classification denotes the arrangement of objects in groups, each of which possesses one or more distinguishing characters. It implies system or order. Even in the most common pursuits of life, we experience the advantages which it confers. The writing-desk, the book-case, the wardrobe, the cupboard, exemplify the utility of classification.

In surveying the works of nature, the student finds a vast diversity of objects, among which he is completely lost, unless guided by some rule or system. So natural and so obvious are the rudiments of classification, that the most inexperienced and uninformed observer cannot fail to perceive and adopt them. First, we detect the three grand divisions of natural things—animal, vegetable and mineral. Each of these requires to be subdivided. If we take the animal kingdom, we discover that

in one class the animals have four feet; in another, they move through the air by wings; that those of a third class live in the water, and so on; thus establishing the classes of quadrupeds, birds and fishes. Quadrupeds, again, consist of a number of families, requiring a subdivision of this class into orders. Some are predacious, as the lion: others ruminate, as the ox; those of a third section are amphibious, as the beaver; and so on of the other orders. Each order requires to be divided into genera; for example, the order of predatory animals, comprises, among others, the cat, the dog and the bear, each of which is the type of a family or genus, which contains several species. The cat genus, for instance, contains the domestic cat, the lion, and the tiger, as three of its species.

The distinctions made in the preceding paragraph are not precisely such as naturalists employ at the present day. They were selected merely to elucidate the principles on which the classes, orders, genera, and species, are based. The objects of the vegetable and mineral departments are arranged on a similar plan.

When I wish to give to an animal, a plant, or a mineral, its scientific name, I designate its genus and species. The generic name of the cat family is *Felis*—a name which applies equally to the common cat, the lion, and the tiger. To distinguish between the three animals, I must ascertain the specific name of each, and affix it to the family name. Thus *Felis domesticus*, the cat; *Felis leo*, the lion; and *Felis tigris*, the tiger.

By the aid of classification, the study of the sciences becomes greatly simplified. So far from being to the learner a useless incumbrance, it is indispensable, and not only that, but it adds pleasure to the pursuit. How beautiful, how sublime is the spectacle which the outward creation assumes when viewed in all the order and harmony of methodical arrangement! How admirable to witness the vast diversity of created things, apparently confused and unconnected, assuming, at the interpretation of a Linnæus or a Cuvier, the form of one stupendous structure, its parts mutually dependent, and linked together with that perfected simplicity and symmetry which bespeak the skill of the Divine Architect!

Not less demonstrable are the utility and necessity of a regular nomenclature. In this, the student is apt to see an insuperable obstacle in the way of his advancement. Many a young lady, who would doubtless have found a better excuse had not this been so convenient, has declared that she would study the charming science of botany, but for the host of hard names with which it is so wantonly encumbered. I have heard intelligent men exclaim indignantly against the introduction of Latin and Greek, and unutterable names into botany, instead of the common and intelligible English names; and even attribute the practice to an exclusive and monopolizing disposition on the part of men of science.

It is absolutely necessary for all practical purposes that the objects of natural science should receive names that will distinguish them among the scientific men of all nations. Otherwise, it were impossible without actual comparison, to ascertain whether or not any two productions of different countries are identical in their character. A single language must therefore be employed as the language of science. For this purpose the Latin has been adopted, by general consent; and most of the specific names of animals and plants are given in that tongue. The names of the genera, however, have been applied without particular regard to any rule; some of them being Latin, and others Greek. In a very large proportion of them, the ancient Greek and Latin terms in common use have been adopted as the scientific names of the genera, to avoid the invention of new names.

For want of a uniform nomenclature, much of the scientific knowledge of former times is for ever lost to the world. Dioscorides, one of the earliest writers on medicine, enumerated seven hundred medicinal plants, of which only four hundred have been correctly ascertained. While Julius Cæsar was engaged in the conquest of Gaul, his soldiers suffered severely by a scorbutic disease, until a cure for it was discovered in a certain herb, called by the historian *Herba Brittanica*, because it came from Britain. Modern commentators are so far from agreeing upon this plant, that four different vegetables have set up their claims to the celebrity which it acquired. Analogous

cases might be cited, without number, to show the injury which botany and medicine have sustained from *common names.* But the most frequent source of error is the application of the same common name to more than one plant. Within the precincts of a single language, the same name is often applied, in common parlance, to five or six different plants. In this section of country, we have nearly a dozen different sorts of "snake root," and a few only of the number are designated by some descriptive epithet, such as "black snake root," "high snake root," "small snake root." The first of these terms is given to two plants, one of which is actively medicinal; the other, comparatively inert. The "pimpernel" was once celebrated for curing the bite of a mad dog; but there are three distinct plants of this name in our neighborhood. Were I to employ different persons to collect for me some "winter green," I should find my winter green to be a mixture of several distinct herbs. The same may be said of "colts' foot," "crow foot," "red root," "rich weed," and many others.

Many of the common names of plants are limited to a small district of country, and nearly all of them are more or less sectional. The dog wood of America is not the dog wood of England. The hemlock of one part of our country, is a fir tree in another place. That which Socrates drank, is believed to have been a compound of other ingredients. The "forget me not," is one thing in Pennsylvania, another in Virginia, and a third in Carolina.

There are other insuperable difficulties in the way of the introduction of common names into science. But I presume that it is unnecessary for me to dwell longer on the subject. Scientific nomenclature appears formidable only at a distance. On a closer examination, the student finds it not devoid of usefulness and beauty. He experiences the "hard names" to vanish before a little industry and a little enterprize, and finally to become simple, intelligible and instructive. H. G.

PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

October 7th.—W. P. Gibbons presented a series of *Cicada Septendecim*, ova, pupa, and perfect insects. The pupa were dug from the earth on the 12th of September. Attempts which had been made by several gentlemen beside himself to detect them immediately after being hatched, had proved unavailing, though many precautions had been taken; the greater number of eggs contained in the branches where they had been deposited being still unhatched. Mr. Ord stated that he had succeeded in obtaining a great number, by selecting eggs which he could perceive were on the point of incubation, and placing them in a tumbler. After ten or twelve hours the insects were to be seen jumping about in the glass with great activity.

October 21st.—Dr. Ruschenberger presented an *Asteria helianthus*, from Callao. It is eaten by the Indians, roasted on coals, and also employed in decoction by the women for the relief of menorrhagia.

Matico, or Soldier's Weed, used as a styptic by the Peruvian soldiers for staunching blood. They never went into a campaign without carrying a bundle of it with them.

Romero de la Puna, from the island of Puna, at the mouth of the river Guayaquil, used by the Indians in bath and vapor alternately for cure of the gout.

Canchalagna, or Chironia Chilensis, used in infusion as a substitute for Peruvian bark in intermittent fever, both in Chili and Peru, and generally preferred to the bark. He had used it on ship board for two years and feel well satisfied with its effects. Dr. W. P. C. Barton tells me he has used it in one or two cases with the happiest results where neither quinine nor bark would remain on the stomach.

Coca, tree of bread and water—anciently used by the Incas of Peru, afterwards was generally employed. At one period yielded annually upwards of $2,500,000 to the revenue. Pentennial—grows in Bolivia, chewed with quick lime as the betel.

H. D. Rogers read a paper on the formation of trap in the red shale on the Delaware, one-third of a mile below New Hope. He also made some observations on the changes of the shale. Referred to a committee consisting of Messrs. I. Lukens, J. Peirce, and Dr. M'Euen.

Prof. W. Rogers read a paper consisting of results of chemical investigations of the waters of the mineral springs of Virginia. Referred to a committee consisting of Dr. Goddard, Professors Johnson and A. D. Bache.

MISCELLANIA.

1. *Eye Stones.*—These little bodies are kept and sold by the apothecaries, for the purpose of cleansing the eyes from particles of sand, dust &c. They are very common, and yet it is probable that hardly one person in an hundred knows what they are. When Humboldt travelled in South America, he met with a tribe of natives, near Cumana, who assserted that they partake of the nature of both stone and animal, and who wished to put sand in the eyes of our travellers, that they might try the power of this wondrous remedy. We owe them to a small shell fish, like a snail, of which they form the operculum or door, for closing the orifice of the shell. As to the benefit derived from them, it is certain that extraneous bodies are often removed from the eyes by their means; but it must also be admitted that this is not the most comfortable means of cleansing the eye.

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2. *Discovery of an ancient British canoe.*—The Brighton Gazette mentions the discovery of an ancient canoe in a bed of silt at North Stoke, near Arundel. It is nearly thirty-five feet in length, 4½ wide in the centre, 4 feet 3 inches wide at one extremity, and 2 feet 10 inches at the other, and is about 2 feet deep. It is formed of the single trunk of an oak, which has been hollowed out, and brought to its present shape with great labor; it is evidently the workmanship of a very early period,

and in all probability was constructed by some of the earliest inhabitants of our island, before the use of iron or even brass was known; the original tree must have been 15 or 16 feet in circumference. Three projections, left in the interior of the boat, appear to have been designed for seats; it is manifest, therefore, that the persons who constructed this vessel were unacquainted with the art of forming boards. The canoe is in truth so similar to some of those which were fabricated by the aborigines of North America, when first visited by Europeans, that we can have no hesitation in concluding that it was formed in a similar manner; namely, by charring such portions of the tree as were necessary to be removed, and then scooping them out with their stone instruments; no doubt this canoe belongs to the same period as the flint and stone instruments called *celts*, which are found in the tumuli on the South Downs. This boat is now in the state of peat or bog-wood.

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3. *A New Observatory at St. Petersburg.*—An observatory, far surpassing in magnitude every similar establishment, is about to be built at St. Petersburg by command of the Emperor. The observatory itself will consist of three towers, with moveable cupolas. Two of these towers are to be appropriated to the Konigsburg heliometer, and the Dorpat refractor: but the centre tower is destined for the reception of an instrument exceeding in size all others of the kind. In the lower part of the towers, the meridian and transportable instruments will be placed. Spacious habitations for five astronomers will be connected by two corridors with these towers; so that the whole will form a continuous building 510 feet in length. Smaller subordinate buildings for various purposes will increase the establishment, for the site of which an eminence between six and seven miles from St. Petersburg has been selected.

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4. *Origin of the term Bucaniers.*—The first predatory hunters of Cuba and Hispaniola were natives of France. From the customs connected with their vocations in the woods arose the formidable name of *Bucanier*, by which the association came to be distinguished, whether pirates or foragers, on shore or in

the wilderness. The term was adopted from the Carib Indians, who called the flesh which they prepared *boucan*, and gave the hut where it was slowly dried and smoked the same appellation. To the title by which the desperadoes of England were known, the French preferred the name of *Flibustier*, said to be a corruption of the English word freebooter. The Dutch named the natives of their country employed in this lawless life *Sea Rovers*. *Brethren of the Coast* was another denomination by which they were known; but all distinctions were finally lost in the title of *Bucaniers of America.—Dampier.*

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5. *Remarkable Cavern.*—A remarkable stalactitical cavern has been discovered at Erpfingen, in the bailiwick of Reutlingen. The entrance is between two rocks, and was closed with three large stones carefully fitted together. The cavern itself is 515 feet long, and contains in one suit six chambers, which are nearly of equal length, from 24 to 32 feet in height, and from 24 to 48 feet in breadth; but they are all separated from each other by irregularities of the ground. Besides this principal cavern, there are several smaller ones on the left and right: the most remarkable of the latter is near the entrance, and forms a kind of gallery thirty feet long, from five to nine feet high, and ten feet broad. The other lateral caves are generally small and low. Though shut up, probably for centuries, it must have formerly been inhabited, or at least served as a place of refuge, as not only pieces of pottery, but also two combs and some rings have been found; every where, but especially in some of the lateral caves, there are numerous human bones of extraordinary size, also petrified bones of large animals, and teeth belonging to animals not known to the sportsmen of the present day. The cavern is dry, the temperature very mild. It is situated in the forest, on the Hohlenberg, three leagues and a half from Reutlingen, half a league from Erpfingen, and one league from Lichtenstein.

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6. *Large Mushroom.*—A Fungus of unusual large size was lately plucked from a pasture field, near Sutton Hall, and is now in the possession of J. Wardel, King's Head, Sutton. Its circum-

ference is 2 feet 5½ inches, breadth 9¼ inches, length of stem 8½ inches, circumference of stem 5½ inches.—*Chester Courant.*

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8. *Manna of Mount Sinai.*—M. Bové formerly director of the gardens and farms of Ibrahim Pacha, at Cairo, in his report made to the Academy of Sciences of the different productions of Egypt, mentions that in 1832 he found the *Tamarix manniferis* (the turfah of the desert) growing in great abundance in the desert, about a day's journey to the northward of Sinai. Women and children were engaged in gathering the manna, which was running from the branches of this shrub. The Arabs assured him that when purified it was equal to the finest honey. What he gathered himself was in large drops, about the size of a pea, pale yellow color, rather agreeable taste, or slightly sweet and gummy. In order to purify it the Arabs throw it into boiling water; it rises to the surface, and is immediately skimmed off. This is probably the manna which nourished the Hebrews. Some authors pretended that the manna of the Hebrews was the production of *Alhage maurorum*, a shrub which is never found but on the borders of the desert, where there is a good deal of nurture; but there was none of this near the desert.

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9. *July a Revolutionary Month.*—On the 9th of this month, in the year 1385, the despotism exercised over Switzerland by the house of Austria was annihilated on the field of Sampach. On the 26th of July, 1581, the confederation of the Low Countries promulgated an edict, by which they renounced their allegiance to Philip II. On the 12th of July, 1680, James II lost the battle of Boyne, which for ever excluded both himself and his posterity from the throne of Great Britain. On the 4th of July, 1776, the Congress of the United States declared their country independent of the English crown. On the 14th of July, 1789, the flag of liberty waved over the French Bastile. And, on the 26th of July, 1830, Charles X. of France signed the death warrant of his dynasty.

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10. *Hindoo Worship.*—The Indian government has determined to abolish the pilgrim tax, and to prohibit Europeans from taking any part in the festivals, processions, &c. made in ho-

nor of Juggernaut, and the other pretended deities of the country.

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11. *Anecdote of Napoleon.* It is well known that Napoleon was in the habit of frequent intercourse with the *savans* of Paris, and he frequently attended the sittings of the institute. When he was informed of Davy's discovery of the decomposition of the alkalies, he asked, with some impetuosity, how it happened that the discovery had not been made in France? "We have never constructed a Voltaic battery of sufficient power," was the answer. "Then," exclaimed Bonaparte, "let one be instantly formed without any regard to labor or cost." The command of the emperor was of course obeyed; and on being informed that it was in full action, he repaired to the laboratory to witness its power. On alluding to the taste produced by the contact of two metals, with that rapidity which characterized all his motions, and before the attendants could interpose any precaution, he thrust the extreme wires of the battery under his tongue, and received a shock which nearly deprived him of sensation. After recovering from its effects, he left the laboratory without making any remark, and was never afterwards heard to refer to the subject.—*Paris' Life of Davy.*

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12. *Number of plants eaten by different animals.*—Linnæus remarks that the cow eats 276 species of plants and rejects 218; the goat eats 449 and rejects 126; the sheep eats 387 and rejects 141; the horse eats 262 and rejects 212; and the hog, more nice in his taste than any of these, eats only 72 species and rejects all the rest.

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13. *Chemistry, as applied to agriculture.*—It is said that the celebrated chemist Lavoisier cultivated 240 acres of land in La Vendee, on chymical principles, in order to set a good example to the farmers. His mode of culture was attended with so much success, that his crop amounted to a third more than those which were produced by the usual method, and in nine years his annual produce was doubled. Yet the generality of

our yeomanry would as soon think of studying Hebrew, as the elementary principles of chemistry.

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14. *Mines of Sweden*—The mines of Sweden are peculiarly rich in important products. The iron, chiefly found in primitive rocks, is the finest in the world, and widely diffused. In 1812, there were 170 mines, 624 smelting houses, 764 forges, producing in all, 1,293,411 cwt. of iron. The exportation in 1821 amounted to 340,000 skippund; and in 1824, had risen to 373,000, in ruder forms. Gold occurs at Adelfora, in Sweden, to no great amount, but the silver mines in Konsberg, in Norway, are the richest in Europe. The metals occur in masses, of which there was once found one, of silver, weighing 600 lbs. There are also lead mines of some importance at Scola, and in other parts of Sweden.—*Encyclopædia of Geog.*

NOTICES OF NEW WORKS.

"*Synopsis of the Organic Remains of the Cretaceous Group of the United States.* By Dr. S. G. Morton. Philadelphia. Key & Biddle. 1834."

Few years have elapsed since the geological features of the United States were first presented to us only in outline, entirely divested of those comparatively minute but important characters which give interest and value to the science, and develope its importance to the arts, and its aid to the miner and husbandman. To Mr. William M'Clure are we indebted for the first series of observations which have laid the foundation for a geological survey of our country, which years of patient and severe labor can alone complete, and which will require the combined exertions of men skilled in every department of natural science. Few laborers are yet in the field; but among the most active and industrious, it gives us great pleasure to name Dr. Morton; who having devoted his leisure hours to the investigation of American geology, has, by confining his illustrations chiefly to particular strata, been able to present novel and important views in the history of one of the most

extended and continuous formations on the globe. A few years since, Mr. Vanuxem and Dr. Morton first discovered that the marl of New Jersey was of the same age as the chalk and concomitant strata of Europe, speaking in general terms; but the latter has since ascertained that it corresponds to the green sand or lowest portion of the cretaceous group, and has proved that instead of being confined to a portion of New Jersey, it extends almost continuously through all the southern states, and sweeping round the termination of the carboniferous group in Alabama, crosses the Mississippi at the Chickasaw Bluffs, and is traced up the Missouri almost to the base of the Rocky Mountains. This is proved by the uniform character of its organic remains throughout this vast extent of country, and affords indisputable evidence of the extreme importance of such data in determining the relative ages of beds, which present almost every variety of mineral character, from a compact limestone to siliceous sand, or argillaceous marl. We refer the student of geology with great confidence to the interesting work of Dr. Morton, which is illustrated by numerous and well executed figures of organic remains.

"*Journal of the Academy of Natural Sciences of Philadelphia. Volume* 7, *Part* 1."—It gives us pleasure to announce that a half volume of this valuable work has lately been published, and the new subjects on natural history illustrated by fourteen well executed plates. The contents are as follow: A catalogue of plants made chiefly in the valleys of the Rocky Mountains, towards the sources of the Columbia, by Nathaniel B. Wyeth. This highly important paper was communicated by Nuttall, the distinguished naturalist, who has in this instance added many new and curious plants to the North American Flora.

This essay is followed by another from the same author, in which he describes some of the rarer or little known plants indigenous to the United States, and preserved in the herbarium of the Academy of Natural Sciences in Philadelphia. The botanist will be pleased with this paper, which must tend greatly to advance a knowledge of the Flora of the United States.

The third paper contains observations on the inferior tertiary

or Eocene formation at Claiborne, Alabama, and a sketch of the geographical distribution of that and other tertiary formations throughout the United States. These remarks are drawn up from personal observation by T. A. Conrad, who, in an appendix to his paper, describes many new species of tertiary fossils.

The fourth paper contains an important and very accurate analysis of some of the coals of Pennsylvania, By H. D. Rogers, F. G. S. of London; and A. D. Bache, Professor of Natural Philosophy and Chemistry in the University of Pennsylvania.

The fifth paper is on a new genus of fresh water bivalves, to which the name of Pleiodon has been given; it is illustrated by a colored copperplate engraving. By T. A. Conrad.

The last paper by the same author contains some observations on the genus Hinnita of Defrance, and the description of a new species, H. Poulsoni, which is accompanied by a colored lithographic plate.

We recommend this Journal to the patronage of the friends of Science, and as materials are accumulating, and another number is shortly to be published, we confidently expect the new numbers of the Journal to be issued at shorter intervals than the preceding have appeared in.

TO READERS AND CORRESPONDENTS.

The Editor's absence from the city during the time a greater portion of the present number of the Advocate was in process of publication, has been the cause of so many errors remaining uncorrected in the article on the Geology of York County. This paper was read before the Geological Society, and the publication of it offered to the Advocate, with the understanding that it should appear as an *original article*, both in the Transactions of the Society and this periodical: as an original communication of this kind it is offered to our readers; and not as an article which has been "printed in volume I. part 2, of the Transactions of the Geological Society," as stated among the errata appended by the author.

Our brother of the "Eclectic Journal of Science," has mentioned a typographical error which escaped notice in the September number of the Advocate, in the essay on Herbaria. The name of one of the authors was printed Riddell; it should have been Reddell.

Several correspondents will receive attention in our next.